

What is claimed is:

1. A method comprising:
delivering a pacing pulse to a chamber of the heart;
sensing a signal within the chamber following the delivery of the pacing pulse; and
determining whether the pacing pulse captured the chamber of the heart based on one or more morphological characteristics of the sensed signal.
2. The method of claim 1, wherein determining whether the pacing pulse captured the chamber comprises:
processing the sensed signal to identify the morphology characteristic;
comparing the identified morphology characteristic to one or more morphology criteria; and
determining that the pacing pulse captured the chamber when the morphology characteristics satisfy the morphology criteria.
3. The method of claim 2, further comprising determining that the pacing pulse did not capture the chamber if the morphology characteristics do not satisfy the morphology criteria.
4. The method of claim 2, wherein the morphology characteristics include a minimum voltage of the sensed signal.
5. The method of claim 4, wherein the morphology criteria specify one of a minimum voltage range and a threshold indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the minimum voltage to one of the minimum voltage range and the threshold.

6. The method of claim 2, wherein the morphology characteristics include a time of minimum voltage of the sensed signal.
7. The method of claim 6, wherein the morphology criteria specify a time of minimum voltage range indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the time of minimum voltage to the time of minimum voltage range.
8. The method of claim 2, wherein the morphology characteristics include a minimum slope of the sensed signal.
9. The method of claim 6, wherein the morphology criteria specify one of a minimum slope range and a threshold indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the minimum slope to one of the minimum slope range and the threshold.
10. The method of claim 2, wherein the morphology characteristics include a time of minimum slope of the sensed signal.
11. The method of claim 10, wherein the morphology criteria specify a time of minimum slope range indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the time of minimum slope to the time of minimum slope range.
12. The method of claim 2, wherein the morphology characteristics include a width of the signal.
13. The method of claim 12, wherein the morphology criteria specify one of a width range and a threshold indicative of capture, the method further

comprising determining that the pacing pulse captured the chamber based on comparison of the width to one of the width range and the threshold.

14. The method of claim 2, wherein the morphology characteristics include a maximum slope of the sensed signal.

15. The method of claim 14, wherein the morphology criteria specify one of a maximum slope range and a threshold indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the maximum slope to one of the maximum slope range and the threshold.

16. The method of claim 2, wherein the morphology characteristics include a time of maximum slope of the sensed signal.

17. The method of claim 16, wherein the morphology criteria specify a time of maximum slope range indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the time of maximum slope to the time of maximum slope range.

18. The method of claim 2, wherein the morphology characteristics include a maximum voltage of the sensed signal.

19. The method of claim 18, wherein the morphology criteria specify one of a maximum voltage range and a threshold indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the maximum voltage to one the maximum voltage range and the threshold.

20. The method of claim 2, wherein the morphology characteristics include a time of maximum voltage of the sensed signal.

21. The method of claim 20, wherein the morphology criteria specify a time of maximum voltage range indicative of capture, the method further comprising determining that the pacing pulse captured the chamber based on comparison of the time of maximum voltage to the time of maximum voltage range.

22. The method of claim 2, wherein the morphology characteristics include a minimum voltage of the sensed signal, a minimum slope of the sensed signal, and a width of the signal.

23. The method of claim 22, further comprising determining whether each of the morphology characteristics satisfies an applicable criterion within the morphology criteria.

24. The method of claim 2, wherein the sensed signal is a filtered sensed signal.

25. The method of claim 1, further comprising filtering the sensed signal, amplifying the sensed signal, and converting the signal to a digital signal.

26. An implantable medical device comprising:
a sensor to sense a signal from within a chamber of a heart following delivery of a pacing pulse; and
a processor to determine whether the pacing pulse captured the chamber of the heart based on one or more morphological characteristics of the sensed signal.

27. The device of claim 26, wherein the processor is further configured to measure the morphology characteristic.
28. The device of claim 26, further comprising a lead having a proximal end and a distal end, the lead comprising an electrode on the distal end.
29. The device of claim 26, further comprising a pulse generator to generate a pacing pulse for delivery to a chamber of the heart via the electrode.
30. The device of claim 26, wherein the processor is configured to:
process the sensed signal to identify the morphology characteristic;
compare the identified morphology characteristic to one or more morphology criteria; and
determine that the pacing pulse captured the chamber when the morphology characteristics satisfy the morphology criteria.
31. The device of claim 30, wherein the processor determines that the pacing pulse did not capture the chamber if the morphology characteristics do not satisfy the morphology criteria.
32. The device of claim 30, wherein the morphology characteristics include a minimum voltage of the sensed signal.
33. The device of claim 32, wherein the morphology criteria specify one of a minimum voltage range and a threshold indicative of capture, the processor determining that the pacing pulse captured the chamber based on comparison of the minimum voltage to one of the minimum voltage range and the threshold.

34. The device of claim 30, wherein the morphology characteristics include a time of minimum voltage of the sensed signal.

35. The device of claim 34, wherein the morphology criteria specify a time of minimum voltage range indicative of capture, and wherein the processor determines that the pacing pulse captured the chamber based on comparison of the time of minimum voltage to the time of minimum voltage range

36. The device of claim 30, wherein the morphology characteristics include a minimum slope of the sensed signal.

37. The device of claim 36, wherein the morphology criteria specify one of a minimum slope range and a threshold indicative of capture, and wherein the processor determines that the pacing pulse captured the chamber based on comparison of the minimum slope to one of the minimum slope range and the threshold.

38. The device of claim 30, wherein the morphology characteristics include a time of minimum slope of the sensed signal.

39. The device of claim 38, wherein the morphology criteria specify a time of minimum slope range indicative of capture, and wherein the processor determines that the pacing pulse captured the chamber based on comparison of the time of minimum slope to the time of minimum slope range.

40. The device of claim 30, wherein the morphology characteristics include a width of the signal.

41. The device of claim 40, wherein the morphology criteria specify one of a width range and a threshold indicative of capture, the processor determining

that the pacing pulse captured the chamber based on comparison of the width to one of the width range and the threshold.

42. The device of claim 30, wherein the morphology characteristics include a maximum slope of the sensed signal.

43. The device of claim 42, wherein the morphology criteria specify one of a maximum slope range and a threshold indicative of capture, the processor determining that the pacing pulse captured the chamber based on comparison of the maximum slope to one of the maximum slope range and the threshold.

44. The device of claim 30, wherein the morphology characteristics include a time of maximum slope of the sensed signal.

45. The device of claim 44, wherein the morphology criteria specify a time of maximum slope range indicative of capture, the processor determining that the pacing pulse captured the chamber based on comparison of the time of maximum slope to the time of maximum slope range.

46. The device of claim 30, wherein the morphology characteristics include a maximum voltage of the sensed signal.

47. The device of claim 46, wherein the morphology criteria specify one of a maximum voltage range and a threshold indicative of capture, the processor determining that the pacing pulse captured the chamber based on comparison of the maximum voltage to one of the maximum voltage range and the threshold.

48. The device of claim 30, wherein the morphology characteristics include a time of maximum voltage of the sensed signal.

49. The device of claim 48, wherein the morphology criteria specify one of a time of maximum voltage range indicative of capture, and wherein the processor determines that the pacing pulse captured the chamber based on comparison of the time of maximum voltage to the time of maximum voltage range.

50. The device of claim 30, wherein the morphology characteristics include a minimum voltage of the sensed signal, a minimum slope of the sensed signal, and a width of the signal.

51. The device of claim 50, wherein the processor is configured to determine whether each of the morphology characteristics satisfies an applicable criterion within the morphology criteria.

52. The device of claim 50, wherein the sensed signal is a filtered sensed signal.

53. The device of claim 26, further comprising a filter to filter the sensed signal, an amplifier to amplify the sensed signal, and an analog-to-digital converter to convert the signal to a digital signal.

54. A computer-readable medium comprising instructions to cause a programmable processor to:
process a signal sensed from a chamber of the heart following delivery of a pacing pulse to the chamber to identify one or more morphological characteristics; and
determine whether a pacing pulse captured a chamber of the heart based on one or more morphological characteristics of the sensed signal.